CONTENTS

Gage Blocks of Superior Stability II:		P. E. Repas, R. H. Goodenow,	
Fully Hardened Steels		R. F. Hehemann	150
Melvin R. Meyerson, William A.		Gage Blocks of Superior Stability III:	
Pennington	3	The Attainment of Ultrastabil-	
Calculated Diffusion-Controlled Evap-		ity	
oration Rates of Elements from		Melvin R. Meverson, Marcos C.	
Germanium			164
CARA	00	Sola	104
G. A. Somorjai	26	The Effect of Austenitizing Tempera-	
Oxidation of the Platinum Metals in		ture on the Cooling Trans-	
Air		formations in 43XX Steels	
W. L. Phillips, Jr	33	E. P. Klier, Jane Jellison	186
Discussion 1063		The Effects of Cold Rolling on the Me-	
Hardening Behavior of Ternary Alloys		chanical Properties of Type 310	
Based on Iron-18% Nickel		Stainless Steel at Room and	
C Floren	38		
S. Floreen	99	Cryogenic Temperatures	
		J. L. Christian, J. D. Gruner,	
Nickel Alloy		L. D. Girton	199
R. B. G. Yeo	48	Strengthening Mechanisms in Mn – V	
Discussion 1063		and Mn - V - N Steels	
Failure of High-Strength Steels in a		E. T. Stephenson, G. H. Karchner,	
Tension-Tension Biaxial Stress		Philip Stark	208
Field with a 2:1 Principal Stress		Discussion 1071	200
Ratio		Precipitation in a High-Nickel Marag-	
	00		
Bruce L. Baird	62	ing Steel	000
Effects of Heat Treatments on the		R. K. Pitler, G. S. Ansell	220
Hardness and Tensile Properties		Discussion 1071	
of Cold Rolled Iodide Hafnium		The Effect of Ordering on the Plastic	
J. G. Goodwin	77	Deformation of Mg ₃ Cd	
The Annealing Behavior of Explosively		N. S. Stoloff, R. G. Davies	247
Shocked Tungsten and Colum-		Discussion 1079	
bium		The Magnetic Aging of Low-Carbon	
M. J. Klein, F. A. Rough	86	Steels and Silicon Irons	
	00		001
Discussion		W. C. Leslie, D. W. Stevens	261
Plastic Deformation of Thin Brazed		Susceptibility of Zirconium and Zirco-	
Joints in Shear		nium Alloys to Delayed-Failure	
C. W. Shaw, L. A. Shepard, J.		Hydrogen Embrittlement	
Wulff	94	D. Weinstein, F. C. Holtz	284
The Structure of 1N-100		Discussion 1079	
S. T. Wlodek	110	Theory of Residual Stresses Due to	
Aging and Plastic Deformation of an		Chemical Concentration Gradi-	
Fe - 0.9% Cu Alloy		ents	
E. Hornbogen	100	O. Richmond, W. C. Leslie, H. A.	
Discosion Logo	120		con a
Discussion		Wriedt	294
Behavior and Effect of Sulphur on Oxy-		A Comparison of Ausforming to Cold	
gen-Free High-Purity Copper		Rolling for Strengthening Stain-	
Matti J. Saarivirta	133	less Steel	
Discussion 1070		S. Floreen, G. W. Tuffnell	301
The Metastable Constitution of		On the Nonhomogeneous Work for	
Quenched Titanium and Zirco-		Wire Drawing	
nium-Base Binary Alloys			309
C. A. Luke, R. Taggart, D. H. Po-		T. A. Trozera	903
lonia	140	Influence of Decomposition Products	
Touris Cl	142	in Ausformed H-11	
lonis Transformation Characteristics of U –		W. W. Gerberich, C. F. Martin, L.	
Mo and U - Mo - Ti Alloys		Raymond	324

Discussion 1080		A. V. Grosse	417
Discussion		A. V. Grosse	
Formation of MgCO ₂		tion Identification	
J. F. Smith, M. J. Smith	337	R. E. Brien	427
Mechanical Properties of Certain Low-		Discussion 1084	
Melting-Point Alloys		Discussion	
L. P. Wilson, R. L. Buckner	346	Orientation on Mechanical Be-	
The Effect of HCl-H2 Sintering Atmos-		havior of a Unidirectionally	
pheres on the Properties of		Solidified Cu-Cr Eutectic Alloy	
Compacted Iron Powder (TN)*		R. W. Hertzberg	434
R. D. McIntyre	351	R. W. Hertzberg An Analysis of Homogenization in	
Work Hardening of Beryllium Wire	-	Powder Compacts Using the	
(TN)		Concentric-Sphere Diffusion	
A. G. Gross, Jr	355	Model	
Preparation of Single Crystals by Arc-	121312	R. W. Heckel	443
Zone Melting (TN)		R. W. Heckel. The Zirconium-Cobalt Alloy System	* ***
O. N. Carlson, F. A. Schmidt,		W. H. Pechin, D. E. Williams,	
W. M. Paulson	356	W. L. Larsen	464
W. M. Paulson A New Fast Method to Extract Hard	000	The Effect of Exposure Time on the	***
Particles for Electron Micros-		Embrittlement of Cu - 2% Be	
copy (TN)		Alloy by Liquid Amalgam	
M. W. Dumais, L. J. Bonis	358	J. V. Rinnovatore, J. D. Corrie,	
Solubility of Nitrogen in Solid Iron Al-	11.163		474
		H. Markus Tensile Properties of Extruded Beryl-	41.4
loys at High Temperatures (TN)		lium From -195 to 200 C	
	360	M I Jacobson	482
T. P. Floridis, W. R. Chilcott, Jr.	900	M. I. Jacobson	402
Creep Behavior of Copper-2% Beryl-		Effect of Small Additions of Colum-	
lium Wire at Slightly Elevated		bium to Wrought, Heat Resist-	
Temperatures (TN)		ant, 3.5 Cr - Mo - V Steel	40.4
R. A. Wood, D. N. Williams, W.	200	R. M. Goldhoff, H. J. Beattie, Jr.	494
Hodge, H. R. Ogden	362	Fractographic Analysis of the Influence	
The Effect of Hydrogen Flow in An-		of Constituent Particles on Fa-	
nealing Permalloy Type Mag-		tigue Crack Propagation in	
netic Alloys (TN)	004	Aluminum Alloys	
W. A. Klawitter, A. A. Lykens.	364	Regis M. N. Pelloux	511
Notch Sensitivity in A-286 Alloy (TN)	0.00	Discussion 1087	
G. N. Maniar, H. M. James	368	Spontaneous Strain-Aging Embrittle-	
Corrections to Vol. 56	371	ment in 70 - 30 Brass	= 1/1
Fatigue of Metals Accelerated by Pro-		C. C. Koch, A. R. Troiano	519
longed Exposure to High Vacuum		Discussion	
R. H. Christensen	373	Effect of Titanium and Zirconium on	
Discussion 1083		Microstructure and Tensile	
Deformation and Fracture of MnS		Properties of Carbide-Strength-	
Crystals		ened Molybdenum Alloys	
H. C. Chao, L. Thomassen, L. H.		W. H. Chang. The Young's Modulus of Alpha Solid-	527
Van Vlack	386	The Young's Modulus of Alpha Solid-	
Discussion 1084		Solution Copper-Nickel-Zinc Al-	
Relationship Between the Behavior of		loys and the Valencies of Cop-	
a Range of Aluminum-Magne-		per, Nickel, and Zinc	
sium Alloys in Uniaxial and Bi-		J. B. Greer, E. H. Bucknall	554
axial Tension		Discussion 1088	
Roger Pearce, P. G. Joshi	399	Solute Interactions at Grain Bound-	
The Solubility of Carbon in Liquid		aries and the Properties of Di-	
Iron to 3160 K and Viscosity		lute Iron-Tungsten Alloys (TN)	
Estimates of Fe - C Solutions		J. H. Westbrook	561
to 2500 K		Strain-Induced vs Pre-existing Precipi-	
J. A. Cahill, A. D. Kirshenbaum,		tation in the Mo-TZC Alloy	
		(TN)	
		W. H. Chang An Improved Soft Solder for Use With	565
* The notation TN appearing in pa	iren-	An Improved Soft Solder for Use With	
theses designates a Technical Note.		Gold Wire (TN)	

J. D. Braun. Formation of a Euteetic Structure in	568	Gamma-Prime Precipitation in an Fe-	
Formation of a Eutectic Structure in		Ni Base Alloy	-0-
the Heat-Affected Zone of Udi-		C. M. Hammond, G. S. Ansell	727
met 700 Welds (TN)		The Density of Liquid Beryllium from	
C. P. Sullivan, W. A. Owczarski,	***	Its Melting Point (1556 K) to 2200 K and Its Expansion on	
W. P. Shirra	572	2200 K and Its Expansion on	
Discussion: The Density of Solid		Melting (TN)	moo
Antimony From 293 to 903 K		A. V. Grosse, J. A. Cahill	739
and Its Volume Change on Fu-		Thermal Expansion of Iodide Titanium	
sion	576	(TN)	-
The Generation of Residual Compres-		H. E. McCoy, Jr.	743
sive Stresses in the Surface Lay-		On the Mechanism of Strengthening in	
ers of Through-Hardening Steel		Maraging Steels (TN)	-
Components by Heat Treat-		H. Conrad	747
ment		Two-Phase Concept Used to Study	
D. P. Koistinen A Study of the Recrystallization Kinet-	581	Brittle Failure Microscopically	
A Study of the Recrystallization Kinet-		(TN)	
ics of the Aluminum-Manganese		Lloyd V. Sutfin, Kamal Asgar	749
Alloy 3003		Effect of Solution Temperature on	
W. C. Setzer, J. G. Morris	589	Stress Rupture in Austenitic	
Discussion 1090		Stainless Steel Containing Phos-	
Effect of Temperature on Nickel Fa-		phorus (TN)	
tigued in Vacuum		Edward A. Loria A Refractory Metal Alloy Hot Pressed	754
R. L. Stegman, M. R. Achter	603	A Refractory Metal Alloy Hot Pressed	
Discussion 1091	200	from Elemental Powders (TN)	
Discussion			756
tron Concentration Phases		J. E. White Diffusion Barriers for Tantalum and	100
Niels Engel	610	Columbium (TN)	
Discussion 1092	010	E. M. Passmore, J. E. Boyd, B. S.	
Anisotropy of Titanium Sheet in Uni-		Lement	760
axial Tension		Critical Cold Work in Heat Treatable	100
Frank P. Larson	620		
Frank R. Larson	020	Aluminum-Base Alloys (TN)	
		R. Wayne Parcel, John C. Mc-	200
tinuous Cooling Transformation of a 0.40% Carbon Steel		Donald	766
D V Faction M Carbon Steel	000	Discussion	
R. V. Fostini, M. Semchyshen	632	The Recrystallization of Alpha Plu-	
Permeability of Tungsten Matrices as		tonium (TN)	=00
a Function of Density, Particle		L. Ianniello	768
Size, and Shape	0.00	Campbell Memorial Lecture: Thirty	
Allen T. Robinson	650	Years of Dislocation Theory and	
A Mechanism for the Embrittlement of		of Rheology — A Study of	
High-Strength Steels by Aque-		Transient Creep	
ous Environments		Charles Crussard	778
G. L. Hanna, A. R. Troiano, E. A.		The Physical Metallurgy and Oxida-	
Steigerwald	658	tion Characteristics of a Cobalt-	
Discussion 1093		Base Superalloy, SM-302	
Discussion		E. J. Felten, R. A. Gregg	804
clusions Within Ductile Metals		Application of a Modified Two-Load	
R. J. Warrick, L. H. Van Vlack.	672	Method for the Determination	
Discussion		of Low-Temperature True	
Oxidation of 90Cb - 10Mo Alloy in the		Stress-Strain Properties of Sev-	
Temperature Range 400 to 1200		eral Commercial Titanium and	
C		Maraging Steel Alloys	
T. L. Kolski	690	R. D. Lloyd, Henry Hahn, George	
Recrystallization Behavior of Cold	0.00	Fischer	823
Rolled TD-Nickel		Fischer Grain Growth in Critically Strained	Cat
		Copper and Copper Zing Allow	
M. C. Inman, K. M. Zwilsky,	701	Copper and Copper-Zinc Alloys	600
D. H. Boone	701	P. Chotinuchit, D. J. Murphy	832
Discussion 1095		The Low-Cycle Fatigue Characteristics	
Some Observations on the Strength and		of a Nickel-Base Superalloy at	
Toughness of Maraging Steels	=	Room Temperature	
S. Floreen, G. R. Speich	714	C. H. Wells, C. P. Sullivan	841
VOLUME 57, 1964			vii

Structure and Properties of PH15 – 7Mo Stainless		An Investigation of the Mechanical Anisotropy of Ausformed Steels	
B. R. Banerjee, J. J. Hauser, J. M.		R. H. Bush, A. J. McEvily, Jr.,	
Capenos	856	W. M. Justusson	991
Recrystallization in Two-Phase Alu-	000	Edge Cracking in Rolling of Heavily	001
minum-Copper Alloys		Crowned Strip (TN)	
R. D. Doherty, J. W. Martin	874	Carl L. Kolbe	1000
Hardness of Inclusion Sulfides	011	Cleavage in Hydrided Zircaloy-2 (TN)	1000
H. C. Chao, L. H. Van Vlack, F.		M. R. Louthan, Jr	1004
Oberin, L. Thomassen	885	The Hardening Mechanism in Marag-	1009
A Rapid X-Ray Method for the Deter-	990	ing Steels (TN)	
mination of Retained Austenite		A. J. Baker, P. R. Swann	1008
R. L. Miller	892		1000
Dislocation Mechanisms in the Elim-	0:74	The Influence of Temperature and Al-	
ination of Inhomogeneous De-		loying Elements on the Solubil-	
		ity of Graphite in Liquid Cobalt (TN)	
formation by Temper Rolling	900		1011
A. J. Goldman	300	W. L. Daines, R. D. Pehlke	1011
		A New Technique for Examining Steel	
Sintered Iron-Copper and Iron-		Cleanliness (TN)	1015
Copper-Tin Alloys	000	Peter Vernia	
N. C. Kothari	909	Officers and Trustees	1020
Viscosity-Composition Relationships in		Medalists, Awards and Life Members.	1021
Molten Plutonium-Iron Alloys	010	Standing Committees	1026
Donald Ofte, L. J. Wittenberg	916	Chapters and Officers	1032
High-Performance High-Speed Steels		Technical Program at 46th Annual	1010
by Design		Convention	1040
Gary Steven, A. E. Nehrenberg,	00*	Awards Luncheon	1041
T. V. Philip	925	Secretary's Report	10.60
Delayed Failure in 70 – 30 Brass	0.40	Stewart G. Fletcher	1042
C. C. Koch, A. R. Troiano	949	Treasurer's Report	
The Influence of the Rate of Oxidation		John Convey	1044
Upon the Properties of Inter-		President's Report	
nally Oxidized Silver-Magne-		Merrill A. Scheil	1050
sium Alloys		Election of Officers	1053
R. A. Bosch, F. V. Lenel, G. S.		Managing Director's Report	
Ansell	960	Allan Ray Putnam	1054
The Stabilization of Austenite by		Report of the Foundation for Educa-	
Closely-Spaced Boundaries		tion and Research	
W. C. Leslie, R. L. Miller	972	Robert J. Raudebaugh	1060
Superplasticity in an Al-Zn Alloy		Annual Dinner	1062
W. A. Backofen, I. R. Turner,		Discussions of Papers	1063
D. H. Avery	980	Index to Volume 57	1099

ENTS

ASM